



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of : **Confirmation No. 6783**  
Hiroshi Kawasaki et al. : Attorney Docket No. 2004\_1479A  
Serial No. 10/507,929 : Group Art Unit 1616  
Filed September 17, 2004 : Examiner Danielle D. Sullivan  
HERBICIDE COMPOSITION AND : **Mail Stop: AMENDMENT**  
WEED-CONTROLLING METHOD  
USING THE SAME

DECLARATION UNDER 37 CFR 1.132

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

THE COMMISSIONER IS AUTHORIZED  
TO CHARGE ANY DEFICIENCY IN THE  
FEES FOR THIS PAPER TO DEPOSIT  
ACCOUNT NO. 23-0975

Sir:

I, **Ryo Hanai**, the undersigned, a citizen of Japan, residing at  
**Shizuoka, Japan** do hereby declare:

That I am an employee of KUMIAI CHEMICAL INDUSTRY CO., LTD.,  
Japan, the assignee of the above-identified United States patent application,  
since April, 1987, being engaged in the research and development works  
relative to herbicide compositions and other related products of the company;

THAT although I am not named as one of the joint inventors in the  
above-identified pending United States patent application, I have full  
acquaintance with the subject matter of the above-identified pending  
application as being a successor of the named inventors Messrs. Kawasaki  
and Miyazawa;

THAT I have a good knowledge of the English and Japanese  
languages and have read and understood the application papers and the  
prosecution history of the application as well as the Examiner's references  
cited in the official actions; and

THAT I have caused the comparative experiments described below either by myself or under my direct supervision on behalf of the inventors, with an object to demonstrate the unexpectedly great advantages obtained with the herbicide compositions formulated with component (A), i.e. pyrimisulfan, and component (B), which is compound (1), i.e. fentrazamide, now examined, in the mass ratio as specified in claim 1 of the above-identified pending patent application.

## COMPARATIVE EXPERIMENTS

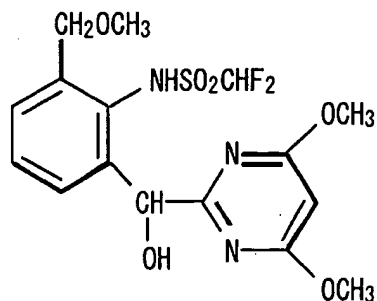
### I. Object of experiments

While claim 1 of the above-identified patent application requires that pyrimisulfan and fentrazamide should be combined in the mass ratio of 1:1-1:15, the object of the following experiments is to demonstrate the significance of this feature on the combination with this ratio as a characteristic parameter having great influences on the performance of the herbicide composition by conducting experiments using various comparative herbicide compositions containing the active ingredients similar to but different from pyrimisulfan with different values of this ratio.

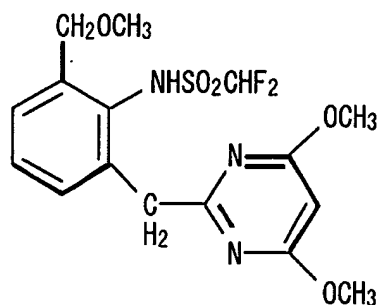
### II. Experimental procedures

#### (1) Formulation of wettable powder (hydrated agent) agent

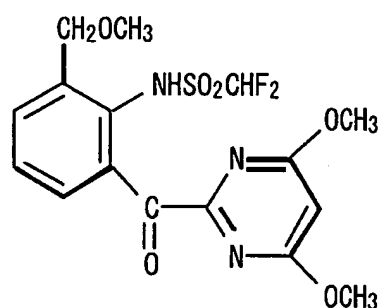
A wettable powder was prepared by blending 10 parts of active ingredient (A-1), i.e. pyrimisulfan (inventive), represented by the formula,



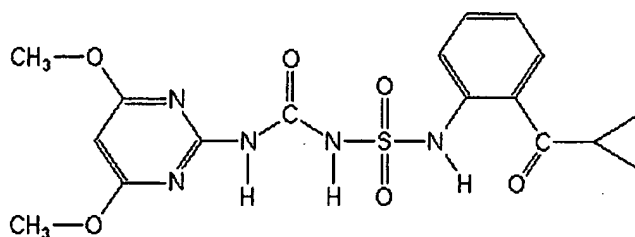
or active ingredient (A-2) (comparative) represented by the formula,



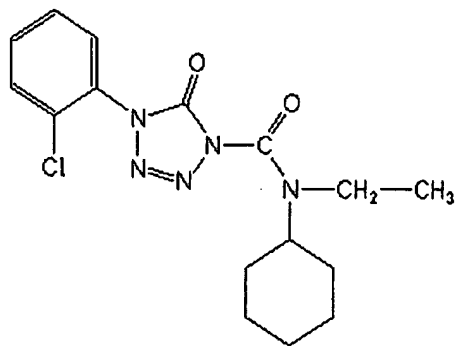
or active ingredient (A-3) (comparative) represented by the formula,



or active ingredient (A-4), i.e. cyclosulfamuron of Goto et al. (comparative), represented by the formula,



or active ingredient (B), i.e. fentrazamide, represented by the formula,



with 0.5 part by mass of polyoxyethylene octylphenyl ether, 0.5 part by mass of  $\beta$ -naphthalene-sulfonic acid-formalin condensate sodium salt, 20 parts by

mass of diatomaceous earth and 69 parts by mass of clay and pulverizing the blend thus obtained. The wettable powder was then diluted with water to give an agent of the wettable powder containing the active ingredient with a dosage shown in Table 2. In case of No. 21-28, two kinds of the wettable powders were diluted with water together to give an agent of the wettable powders containing the active ingredients each with a dosage shown in Table 2.

## (2) Evaluation tests on weed-controlling effect and degree of chemical damage

A 100 cm<sup>2</sup> wide plastic pot was filled with a paddy field soil and, after watering and shuffling, seeds of each of early watergrass (Ec), heartshape false pickerelweed (Mo) and rock's bulrush (Sc) were sowed in a depth of 0.5 cm followed by pooling of water in a depth of 3 cm. Thereafter, a paddy rice plant (Or) at the two-leaf stage was transplanted in a transplanting depth of 2 cm. The next day, an agent of the wettable powder(s) was applied on the water surface of the plastic pot which was kept in the greenhouse. After 21 days, the weed-controlling effects of the agent and the degrees of chemical damages to the plants were evaluated according to the criteria as given in Table 1. The results are shown in Table 2.

Table 1

Index	Weed-controlling effect and degrees of chemical damages (Growth inhibition degree in portions above soil level)
10	95% or higher growth inhibition
9	not less than 85% but less than 95% growth inhibition
8	not less than 75% but less than 85% growth inhibition
7	not less than 65% but less than 75% growth inhibition
6	not less than 55% but less than 65% growth inhibition
5	not less than 45% but less than 55% growth inhibition
4	not less than 35% but less than 45% growth inhibition
3	not less than 25% but less than 35% growth inhibition
2	not less than 15% but less than 25% growth inhibition
1	not less than 5% but less than 15% growth inhibition
0	less than 5% growth inhibition

Table 2

No.	Active ingredient	Dosage (g/10 are)	Weed-controlling effect			Chemical damages
			Ec	Mo	Sc	
1	None	-	0	0	0	0
2	A-1	6.3	10	10	10	0
3		1.6	9	10	10	0
4		0.4	7	10	10	0
5		0.2	3	5	6	0
6		0.1	1	2	1	0
7	A-2	6.3	8	9	10	0
8		1.6	4	5	7	0
9		0.4	0	0	2	0
10	A-3	6.3	10	10	9	2
11		1.6	7	7	6	0
12		0.4	3	0	5	0
13	A-4	6.3	7	10	10	0
14		1.6	3	9	10	0
15		0.4	1	7	4	0
16		0.1	0	2	0	0
17	B	6.3	10	10	7	0
18		1.6	10	6	4	0
19		0.4	1	2	2	0
20		0.1	0	0	0	0
21	A-1 + B	0.4+1.6	10	10	10	0
22		0.1+0.4	8	10	9	0
23		0.2+0.1	5	8	7	0
24		0.4+0.1	6	10	9	0
25	A-2 + B	0.4+1.6	9	6	5	0
26	A-3 + B	0.4+1.6	10	4	6	0
27	A-4 + B	0.4+1.6	10	10	6	0
28		0.1+0.4	2	5	3	0

### III. Conclusion

Experiments 21 and 22 are within the range of claim 1 of the present application while Experiments 23 to 28 are comparative showing.

The results of the evaluation tests in Table 2 are summarized in Tables 3 to 6 below in relation to the mass ratio of component (A) to component (B).

In Experiments 27 and 28, cyclosulfamuron (A-4) recited in Goto et al. is used in the same amount as in Experiments 21 and 22, respectively.

Experiment 27 shows additive effects on heartshape false pickerelweed (Mo) but poor result in weed-controlling effect on rock's bulrush (Sc). See Table 3 below. Experiment 28 shows no synergistic effects. See Table 4 below.

In Experiments 25 and 26, active ingredients (A-2) and (A-3) having similar structure to pyrimisulfan are used. No synergistic effects are shown. See Table 3 below.

In Experiments 23 and 24, a mass ratio of pyrimisulfan and fentrazamide is 1:0.5 or 1:0.25, which ratio is outside of the claimed range. Experiment 23 shows slight synergistic effects but Experiment 24 fails to show a synergistic effect. See Tables 5 and 6.

Experiments 21 and 22 show apparent synergistic effects. In particular, in Experiments 22, good weed-controlling effects are obtained in very low doses of the active ingredients used. See Tables 3 and 4 below.

Table 3

No.	Active ingredient	Dosage (g/10 are)	Weed-controlling effect			Chemical damages
			Ec	Mo	Sc	Or
4	A-1	0.4	7	10	10	0
18	B	1.6	10	6	4	0
21	A-1 + B	0.4+1.6	10	10	10	0
9	A-2	0.4	0	0	2	0
18	B	1.6	10	6	4	0
25	A-2 + B	0.4+1.6	9	6	5	0
12	A-3	0.4	3	0	5	0
18	B	1.6	10	6	4	0
26	A-3 + B	0.4+1.6	10	4	6	0
15	A-4	0.4	1	7	4	0
18	B	1.6	10	6	4	0
27	A-4 + B	0.4+1.6	10	10	6	0

Table 4

No.	Active ingredient	Dosage (g/10 are)	Weed-controlling effect			Chemical damages
			Ec	Mo	Sc	Or
6	A-1	0.1	1	2	1	0
19	B	0.4	1	2	2	0
22	A-1 + B	0.1+0.4	8	10	9	0
16	A-4	0.1	0	2	0	0
19	B	0.4	1	2	2	0
28	A-4 + B	0.1+0.4	2	5	3	0

Table 5

No.	Active ingredient	Dosage (g/10 are)	Weed-controlling effect			Chemical damages
			Ec	Mo	Sc	Or
5	A-1	0.2	3	5	6	0
20	B	0.1	0	0	0	0
23	A-1 + B	0.2+0.1	5	8	7	0



Table 6

No.	Active ingredient	Dosage (g/10 are)	Weed-controlling effect			Chemical damages
			Ec	Mo	Sc	Or
4	A-1	0.4	7	10	10	0
20	B	0.1	0	0	0	0
24	A-1 + B	0.4 + 0.1	6	10	9	0

As is clearly understood from above, great and unexpected synergistic effects can be obtained in the weed-controlling effects using the inventive herbicide composition which is formulated with pyrimisulfan and fentrazamide in the claimed range of mass ratio.

I hereby declare that all statements made herein of my own knowledge are true, and that all statements on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: March 24, 2009

Ryo Hanai  
Ryo HANAI